DOCUMENT RESUME

ED 068 362 SE 014 996

AUTHOR	Lin-Fu, Jane S., Comp.
TITLE	Selected Bibliography on Lead Poisoning in Children.
INSTITUTION	Health Services and Mental Health Administration (DHEW), Rockville, Md. Maternal and Child Health Service.
PUB DATE	71
NOTE	35p.
AVAILABLE FROM	Superintendent of Documents, Government Printing Office, Washington, D. C. 20402 (Stock No. 1730-0014, $0.25)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Bibliographies; *Children; Diseases; Health; *Literature; Reference Materials; Scientific Research; *Special Health Problems
IDENTIFIERS	*Lead Poisoning

ABSTRACT

This comprehensive bibliography was prepared in response to the growing interest in the problem of childhood lead poisoning. Most of the papers noted are from the pediatric literature and include only those published in English. A limited number of papers on experiments in laboratory animals are cited. Documents are grouped under several general headings according to their main emphasis or topic of investigation: epidemiology; causes of lead poisoning; detection and indices of exposure; metabolism; metabolic disturbances and toxicity; pica; and prevention, treatment, and management. Since many of the papers cover several related topics, cross-references are given at the end of each section. Over 200 items are listed, covering the period 1942-1971. The bibliography would be useful as a reference source for libraries and/or those working in community health programs. (BL)

ED 068362

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

selected bibliography on

LEAD POISONING in children

SE 014 996

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service / Health Services and Mental Health Administration

ED 068362

selected bibliography on

LEAD POISONING IN CHILDREN

Compiled by

JANE S. LIN-FU, M.D., F.A.A.P.
Pediatric Consultant, Maternal and Child Health Service

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service • Health Services and Mental Health Administration
Maternal and Child Health Service • Rockville, Maryland
1971

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 25 cents
Stock Number 1730-0014

FOREWORD

This bibliography was prepared in response to the growing interest in the problem of childhood lead poisoning. It includes only literature published in English. Most of the papers are from the pediatric literature, but on topics which have been investigated more thoroughly in relation to adults than to children (such as metabolism, indices of exposure, and chronic renal complications) papers that report studies in adults are also included. A limited number of papers on experiments in laboratory animals are cited.

The papers are grouped under several general headings according to their main emphasis or topic of investigation. Since many of the papers cover several related topics, cross-references are given at the end of each section.

Jane S. Lin-Fu, M.D.

CONTENTS

GENERAL INFORMATION..... 1

Reviews and Reports..... 1
Epidemiology..... 4

EXPOSURE AND INDICES OF EXPOSURE..... 5

Common Sources and Exposure..... 5
Earthenware and Miscellaneous Sources.... 8
Blood Lead..... 9
Urine Lead.....11
Hair Lead.....12
ALA and ALAD.....12
Coproporphyrin, Porphobilinogen, and Protoporphyrin.....14

METABOLISM.....16

METABOLIC DISTURBANCES AND TOXICITY.....17

General Information.....17
Neurological and Psychological Sequelae.....18
Disturbances in Erythrocyte and Heme Synthesis.....19
Renal Involvement.....20
Miscellaneous.....21

PICA.....23

PREVENTION, TREATMENT, AND MANAGEMENT.....24

AUTHOR INDEX.....26

GENERAL INFORMATION

Reviews and Reports

1. American Academy of Pediatrics Subcommittee on Accidental Poisoning: Prevention, Diagnosis, and Treatment of Lead Poisoning in Childhood. PEDIATRICS 44:291-298, August 1969.

2. Barltrop, D.: Lead Poisoning in Childhood. POSTGRADUATE MED. J. 44:537-548, July 1968.

3. Byers, R.K.: Lead Poisoning: Review of the Literature and Report of 45 Cases. PEDIATRICS 23:585-603, March 1959.

4. Chisolm, J.J.: Childhood Lead Intoxication. Diagnosis, Management and Treatment. MED. TIMES 98:92-106, September 1970.

5. Chisolm, J.J.: Chronic Lead Intoxication in Children. DEVEL. MED. & CHILD. NEUROL. 7:529-536, October 1965.

6. Chisolm, J.J.: Lead Poisoning. SCIENTIFIC AMERICAN 224:15-23, February 1971.

7. Chisolm, J.J.; Kaplan, E.: Lead Poisoning in Childhood: Comprehensive Management and Prevention. J. PEDIATRICS 73:942-950, December 1968.

8. Cohen, G.J.; Ahrens, W.E.: Chronic Lead Poisoning: A Review of Seven Years' Experience at the Children's Hospital, District of Columbia. J. PEDIATRICS 54:271-284, March 1959.

9. Christian, J.R.: Childhood Lead Poisoning: A Major Urban Health Problem. NEBRASKA STATE MED. J. 54:677-682, October 1969.

10. Christian, J.R.; Celewyez, B.S.; Andelman, S.L.: A Three-Year Study of Lead Poisoning in Chicago. AM. J. PUB. HEALTH 54:1241-1251, August 1964.

11. Feldman, H.T.: Lead Poisoning: Salient Features in its Diagnosis and Treatment. CLINICAL PROC., CHILDREN'S HOSP. WASHINGTON, D.C. 7:196-205, 1959.

12. Freeman, R.: Chronic Lead Poisoning in Children: A Review of 90 Children Diagnosed in Sydney, 1948-1967, Clinical Features and Investigations. MED. J. AUSTRALIA 1:648-651, March 28, 1970.

13. Greengard, J.; Zollar, L.; Sharifi, M.: Medical Progress in the Prevention of Childhood Lead Intoxication. ILLINOIS MED. J. 133:615-618, 650, May 1968.

14. Ingalls, T.H.; Tiboni, E.M.; Werrin, M.: Lead Poisoning in Philadelphia, 1955-1960. ARCH. ENVIRON. HEALTH 3:575-579, November 1961.

15. Jenkins, C.D.; Mellins, R.B.: Lead Poisoning in Children: A Study of Forty-Six Cases. A.M.A. ARCH. NEUROL. & PSYCHIAT. 77:70-78, January 1957.

16. Lead Industries Association, Inc.: FACTS ABOUT LEAD AND PEDIATRICS. The Association, 292 Madison Ave., New York, N.Y. 10017, 1969. 10 pp.

17. Lin-Fu, J.S.: Childhood Lead Poisoning - An Eradicable Disease. CHILDREN 17:2-9, January-February 1970.

18. Lin-Fu, J.S.: LEAD POISONING IN CHILDREN. PHS Pub. 2108. U.S. Dept. HEW, Public Health Service, Maternal and Child Health Service, Rockville, Md. 20852. 1967, revised 1970. 25 pp.

19. McDonald, J.M.; Kaplan, E.: Incidence of Lead Poisoning in the City of Baltimore. JAMA 119:870-87, July 11, 1942.

20. McLaughlin, M.D.: Lead Poisoning in Children in New York City, 1950-1954. NEW YORK STATE J. MED. 56:3711-3714, December 1956.

21. Moncrieff, A.A.; Koumides, O.P.; Clayton, B.E ; Patrick, A.D.; Renwick, A.G.C.; Roberts, G.E.: Lead Poisoning in Children. ARCH. DIS. CHILD. 39:1-13, February 1964.

22. Moore, J.E.: Community Aspects of Childhood Lead Poisoning. AM. J. PUB. HEALTH 60:1430-1434, August 1970.

23. Orson, J.; May J.B.: Lead Intoxication in Children: A Current Problem in Providence, Rhode Island. RHODE ISLAND MED. J. 48:608-611, November 1965.

24. Rennert, O.M.; Weiner, P.; Madden, J.: Asymptomatic Lead Poisoning in 85 Chicago Children. CLINICAL PEDIATRICS 9:9-13, January 1970.

25. Rothschild, E.O.: Lead Poisoning: The Silent Epidemic. NEW ENG. J. MED 283:704-705, Sept 24, 1970.

26. Smith, H.D.: Pediatric Lead Poisoning. ARCH. ENVIRON. HEALTH 8:256-261, February 1964.

27. U.S. Dept Health, Education, & Welfare, Environmental Protection Agency: ENVIRONMENTAL LEAD AND PUBLIC HEALTH. Air Pollution Control Office Pub. No. AP-90, March 1971.

28. U.S. Dept. Health, Education, and Welfare, Public Health Service: THE SURGEON GENERAL'S POLICY STATEMENT ON MEDICAL ASPECTS OF CHILDHOOD LEAD POISONING. November 1970. Available from Bureau of Community Environmental Management, PHS, 5600 Fishers Lane, Rockville, Md. 20852. 12 pp.

29. Williams, H.; Kaplan, E.; Couchman, C.E.; Sayers, R.R.: Lead Poisoning in Young Children. PUB. HEALTH REPORTS 67:230-236, March 1952.

Epidemiology

30. Blanksma, L.A.; Sachs, H.K.; Murray, E.F.; O'Connell, M.J.: Incidence of High Blood Lead Levels in Chicago Children. PEDIATRICS 44:661-667 November 1969.

31. Bradley, J.E.; Powell, A.E.; Niermann, W.; McGrady, J.R., and Kaplan, E.: The Incidence of Abnormal Blood levels of Lead in a Metropolitan Pediatric Clinic. J. Pediatrics 49:1-6, July 1956.

32. Freeman, R.: Chronic Lead Poisoning in Children: A Review of 90 Children Diagnosed in Sydney, 1948-1967. 1. Epidemiological aspects. MED. J. AUSTRALIA 1:640-647, March 28, 1970.

33. Jacobziner, H: Lead Poisoning in Childhood: Epidemiology, Manifestations and Prevention. CLINICAL PEDIATRICS 5:277-286, May 1966.

34. Jacobziner, H.; Raybin, H.W.: The Epidemiology of Lead Poisoning in Children. ARCH. PEDIATRICS 79:72-75, February 1962.

35. Spector, M.J.; Guinee, V.F.: Epidemiology of Lead Poisoning in New York City - 1970. Presented at APHA 98th Annual Meeting, Houston, Texas, Oct. 26, 1970.

See also 37, 41, 45, 47, 49, 72, 73, 81, 98-101, 142, 144, 163, 184, 197.

EXPOSURE AND INDICES OF EXPOSURE

Common Sources and Exposure

36. Barltrop, D.: Environmental Lead and its Pediatric Significance. POSTGRADUATE MED. J. 45:129-134, February 1969.

37. Barltrop, D.; Killala, N.J.P.: Factors Influencing Exposure of Children to Lead. ARCH. DIS. CHILDH. 44:476, August 1969.

38. Barltrop, D.; Killala, N.J.P.: Faecal Excretion of Lead by Children. LANCET 2:1017-1019, November 11, 1967.

39. California Department of Public Health, Air Resources Board: LEAD IN THE ENVIRONMENT AND ITS EFFECTS ON HUMANS. Berkeley, 1967.

40. Cannon, H.L.; Bowles, J.M.: Contamination of Vegetables by Tetraethyl Lead. SCIENCE 137:765, 766, Sept. 7, 1962.

41. Chisolm, J.J.; Harrison, H.E.: The Exposure of Children to Lead. PEDIATRICS 18:943-957, December 1956.

42. Chow, T.J.; Carl, J.L.: Lead Aerosols in the Atmosphere: Increasing Concentrations. SCIENCE 169:577-580, August 7, 1970.

43. Emmerson, B.T.: Atmospheric Contamination With Lead. ANN.INTERN.MED. 68:488-490, Feb. 1968.

44. Ettinger, M.B.: Lead in Drinking Water. In SYMPOSIUM ON ENVIRONMENTAL LEAD CONTAMINATION. PHS Pub. 1440. U.S. Dept. HEW, Public Health Service, 1966, pp 21-27.

45. Fairey, F.S.; Gray, J.W.: Soil Lead and Pediatric Lead Poisoning in Charleston, S.C. J. SOUTH CAROLINA MED. ASSOC. 66:79-82, March 1970

46. Goldsmith, J.R.; Hexter, A.C.: Respiratory Exposure to Lead: Epidemiological and Experimental Dose-Response Relationships. SCIENCE 158:132-134 October 6, 1967.

47. Griggs, R.C.; Sunshine, I.; Newill, V.A.; Newton, B.W.; Buchanan, S.; Rasch, C.A.: Environmental Factors in Childhood Lead Poisoning. JAMA 187:703-707, March 1964.

48. Hunt, W.F., Jr.; Pinkerton, C.; McNulty, O.; Creason, J.P.: THE 77 MIDWESTERN CITY STUDY: A Study of Trace Element Pollution of the Air. Presented at the Fourth Annual Conference on Trace Substances, University of Missouri, Columbia, June 23-24, 1970.

49. Kehoe, R.A.; Thamann, F.; Cholak, J.: On the Normal Absorption and Excretion of Lead: Lead Absorption and Excretion in Infants and Children. J. INDUSTRIAL HYGIENE 15:301-305, September 1933.

50. Kleinman A.: Investigation of Lead Residues of Growing Fruits and Vegetables. PESTICIDE MONITORING J. 1(4):8-10, March 1967.

51. Kopp, J.F.; Kroner, R.C.: TRACE METALS IN WATERS OF THE UNITED STATES: A 5-YEAR SUMMARY OF TRACE METALS IN RIVERS AND LAKES OF THE U.S. (OCT. 1, 1962-SEPT. 30, 1967). U.S. Dept Interior, FWPCA, Division Pollution Surveillance, Cincinnati, Ohio. 1970.

52. Lagerwerff, J.V.; Specht, A.W.: Contamination of Roadside Soil and Vegetation with Cadmium, Nickel, Lead and Zinc. ENVIRON. SCI. TECHN. 4:583-586, July 1970.

53. Lewis K.: The Diet as a Source of Lead Pollution. In SYMPOSIUM ON ENVIRONMENTAL LEAD CONTAMINATION. PHS Pub. 1440. U.S. Dept. HEW, Public Health Service, 1966.

54. Morris, W.: Lead in Total Diet Samples and Typical Foods. INTERBUREAU BY-LINES (U.S. Dept. HEW, FDA) 2:28, July 1965.

55. Murthy, G.K.; Rhea, U.; Peeler, J.T.: Rubidium & Lead Content of Market Milk. J. DAIRY SCIENCE 50:651-654, May 1967.

56. Patterson, C.C.: Contaminated & Natural Lead Environments of Man. ARCH.ENVIRON. HEALTh 11:344-360, Sept. 1965.

57. Schroeder, H.A.; Brattleboro, V.T.; Tipton, L. H.: The Human Body Burden of Lead. ARCH. ENVIRON. HEALTH 17:965-978, December 1968.

58. Thomas, H.V., et al: Blood Lead of Persons Living Near Freeways. ARCH. ENVIRON. HEALTH 15: 695-702, December 1967.

59. U.S. Dept. Health, Education, and Welfare, Public Health Service: SYMPOSIUM ON ENVIRONMENTAL LEAD CONTAMINATION. PHS Pub. No. 1440, 1966.

60. U.S. Dept Health, Education and Welfare, Public Health Service: SURVEY OF LEAD IN THE ATMOSPHERE OF THREE URBAN COMMUNITIES. PHS Publication No. 999 AP-12, 1970.

See also 1-35, 59, 60, 97, 130-134, 136-138, 144.

Earthenware and Miscellaneous Sources

61. Ames, D.C.; Swift, P.N.: Lead Poisoning in Blind Children. BF J. MED. J. 3:152-153, July 20, 1968.

62. Angle, C.R.; McIntire, M.S.: Lead Poisoning During Pregnancy. AM. J. DIS. CHILDH. 108:436-439, October 1964.

63. Bacon, A.P.C.; Froome, K.; Gent, A.E.; Cooke, T.K.; Sowerby, P.: Lead Poisoning from Drinking Soft Water. LANCET 1:264-6, February 4, 1967.

64. Biehusen, F.C.; Pulaski, E.J.: Lead Poisoning After Ingestion of a Foreign Body Retained in the Stomach. NEW ENG. J. MED. 254:1179-1181, June 21, 1956.

65. Block, J.L.: The Accident That Saved Five Lives. GOOD HOUSEKEEPING p. 60-70, November 1969.

66. Forsby, N.; Fristedt, B.; Kjellman, B.: Acute Lethal Poisoning After Ingestion of Metallic Lead. ACTA PAEDIAT. SCAND. Supplement 177:107, 1967.

67. Harris, R.W.; Elsea, W.R.: Ceramic Glaze as a Source of Lead Poisoning. JAMA 202:544-546, November 6, 1967.

68. Klein, M.; Namer, R.; Harpur, E.; Carbin, R.: Earthenware Containers as a Source of Fatal Lead Poisoning. NEW ENG. J. MED. 383:669-672, September 24, 1970.

69. Lead Poisoning From Battery Cases. INTERNATIONAL MED. DIGEST 65:120, 1954.

70. Palmisano, P.A.; Sneed, R.C.; Cassady, G.: Untaxed Whiskey and Fetal Lead Exposure. J. PEDIATRICS 75(5):869-872, November 1969.

71. Patterson, M.; Jernigan, W.C.T.: Lead Intoxication from Moonshine. GENERAL PRACTICE 40(6):126-130, October 1969.

72. Travers, E.; Rendel-Short, J.; Harvey, C.C.: The Rotherham Lead Poisoning Outbreak. LANCET 2:113, July 21, 1956.

73. Turner, W.; Bamford, F.N.; Dodge, J.S.: Lead Poisoning at Bradford (Battery Case Burning). BRIT. MED. J. 3:56, July 1, 1967.

74. Walls, A.D.: Home-made Cider: Source of Lead Poisoning. BRIT. MED. J. 1:98, January 11, 1969.

75. Warley, M.A.; Bladdedge, P.; O'Gorman, P.: Lead Poisoning From Eye Cosmetic. BRIT. MED. J. 1:117, January 13, 1968.

See also 3, 8, 15, 21, 27

Blood Lead

76. Delves, H.T.: A Micro-sampling Method for the Rapid Determination of Lead in Blood by Atomic Absorption. SPECTROPHOTOMETRY ANALYST 95:431-438, May 1970.

77. Farrelly, R.O.; Pybus, J.: Measurement of Lead in Blood & Urine by Atomic Absorption. SPECTROPHOTOMETRY CLIN.CHEM. 15:566-574, 1969.

78. Gibson, S.L.M.; Lam, C.H.; McCrae, W.M.; Goldberg, A.: Blood Lead Levels in Normal and Mentally Deficient Children. ARCH. DIS. CHILD. 42:573-578, December 1967.

79. Goldwater, L.J.; Hoover, A.W.: An International Study of "Normal" Levels of Lead in Blood and Urine. ARCH. ENVIRON. HEALTH 15:60-63, July 1967.

80. Hessel, D.W.: A Simple & Rapid Quantitative Determination of Lead in Blood. ATOMIC ABSORPTION NEWSLETTER 7:55, 1968.

81. Kaplan, E.; McDonald, J.M.: Blood Lead Determination as a Health Department Laboratory Service. AM. J. PUB. HEALTH 32:481-486, May 1942.

82. Keppler, J.F.; Maxfield, M.E.; Moss, W.D.; Tietjen, G.; Linch, A.L.: Interlaboratory Evaluation of the Reliability of Blood Lead Analyses. AM. INDUSTR. HYGIENE ASSOC. J. 31:412-429, July-August 1970

83. Kubota, J.; Lazar, V.A.; Losee, F.: Copper, Zinc, Cadmium, and Lead in Human Blood from 19 Locations in the United States. ARCH. ENVIRON. HEALTH 16:788-793, June 1968.

84. Robinson, M.J.; Karpinski, F.E.; Brieger, H.: The Concentration of Lead in Plasma, Whole Blood and Erythrocytes of Infants and Children. PEDIATRICS 21:793-796, May 1958.

85. Selander, S.; Cramer, K.: Determination of Lead in Blood by Atomic Absorption Spectrophotometry. BRIT.J. INDUSTR. MED. 25:209-213, July 1968.

86. Selander, S.; Cramer, K.: Interrelationships Between Lead in Blood, Lead in Urine and ALA in Urine During Lead Work. BRIT. J. INDUSTR. MED. 27:28-39, January 1970.

87. Williams, M.K.; King, E.; Walford, J.: Methods for Estimating Objectively the Comparative Merits of Biological Tests of Lead Exposure. BRIT. MED. J. 1:618-621, March 9, 1968.

88. Woods, G.E.; Walters, R.M.: Lead Poisoning in Mentally Subnormal Children. LANCET 2:592, September 1964.

See also 4, 6-8, 18, 21, 24, 27, 28, 30, 31, 33, 46, 56-60, 101, 109-111, 113, 115, 130-134, 190, 191, 199, 200.

Urine Lead

89. Cramer, K.; Selander, S.: Studies in Lead Poisoning: Comparisons between Different Laboratory Tests. BRIT. J. INDUSTR. MED. 22:311-314, October 1965.

90. deBruin, A.; Hoolboom, H.: Early Signs of Lead Exposure. BRIT. J. INDUSTR. MED. 24:203-212, July 1967.

91. Knockaert, O.E.; Maes, G.L.; Faes, M.H.: A Polarographic Method for the Simultaneous Determination of Lead & Cadmium in Urine. AM. INDUSTR. HYG. ASSOC. J. 28:595-598, November-December 1967.

92. Kopito, L.; Shwachman, H.: Determination of Lead in Urine by Atomic Absorption Spectroscopy Using Coprecipitation with Bismuth. J. LAB. CLIN. MED. 70:326-332, August 1967.

93. Segal, R.J.: Nonspecificity of Urinary Lead Measurements by Atomic Absorption Spectroscopy. A Spectrophotometric Method for Correction. CLIN. CHEM. 15:1124-31, December 1969.

94. Selander, S.; Cramer, K.: Determination of Lead in Urine by Atomic Absorption Spectrophotometry. BRIT. J. INDUSTR. MED. 25:139-143, April 1968.

95. Torres, F.: ATOMIC ABSORPTION MICROSAMPLING OF LEAD, CADMIUM, INDIUM, AND THALLIUM IN URINE. U.S. AEC Sandia Corp. Report No. SC-RR-69-784, Dec. 1969.

96. Whitaker, J.A.; Austin, W.; Nelson, J.: Edathamil Calcium Disodium (Versenate) Diagnostic Test for Lead Poisoning. PEDIATRICS 29:384-388. March 1962.

See also 4, 27 28, 41, 49, 59, 60, 77, 79, 86, 87, 124, 130-134, 158, 191, 199, 200

Hair Lead

97. Hammer, D.I.; Finklea, J.F.; Hendricks, R.M.; Shy, C.M.; Horton, R.J.M.: Hair Trace Metal Levels and Environmental Exposure. AM. J. EPIDEM. 93(2): 84-92, February 1971.

98. Kopito, L.; Briley, A.M.; Shwachman, H.: Chronic Plumbism in Children, Diagnosis by Hair Analysis. JAMA 209, 2:243-248, July 1969.

99. Kopito, L.; Byers, R.K.; Shwachman, H.: Lead in Hair of Children with Chronic Lead Poisoning. N. ENG. J. MED. 276:949-953, April 1967.

100. Pueschell, S.M., et al: Increased Lead Burden. CLINICAL INSIGHTS IN PEDIATRICS 9:1, June 1969.

ALA and ALAD

101. Blanksma, L.A.; Sachs, H.K.; Murray, E.F.; O'Connell, M.J.: Failure of the Urinary Delta Aminolevulinic Acid Test to Detect Pediatric Lead Poisoning. AM. J. CLIN. PATH. 53:956-962, June 1970.

102. Bonsignore, D.; Calissano, P.; Cartasegna, C.: Erythrocytic ALA Dehydratase and Lead. PANMINERVA MEDICA 8:282-284, July-August 1966.

103. Chisolm, J.J.: Determination of Delta ALA in Plasma. ANALYT. CHEM. 22:54-64, January 1968.

104. Cramer, K.; Selander, S.: Control of Lead Workers by Determination of Urinary Delta Aminolaevulinic Acid. BRIT. J. INDUSTR. MED. 24:283-288, October 1967.

105. deBruin, A.: Effect of Lead Exposure on the Level of Delta Aminolevulinic-Dehydratase Activity. MED. LAVORO 59:411-418, June-July 1968.

106. Feldman, F.; Lichtman, H.C.; Oransky, S.; Sta Ana, E.; Reiser, L.: Serum ALA in Plumbism. J. PEDIATRICS 74:917-923, June 1969.

107. Gibson, S.L.M.; Goldberg, A.: Defects in Haem Synthesis in Mammalian Tissues in Experimental Lead Poisoning and Experimental Porphyria. CLIN. SCIENCE 38:63-72, January 1970.

108. Haeger-Aronsen, B.: Studies on Urinary Excretion of Delta Aminolaevulinic Acid and Other Haem Precursors in Lead Workers and Lead Intoxicated Rabbits. SCAND. J. CLIN. LAB. INVEST. 12: Suppl. 47, 1-128, 1960.

109. Hernberg, S.; Nikkanen, J.: Enzyme Inhibition by Lead Under Normal Urban Conditions. LANCET 1:63-64, January 10, 1970.

110. Hernberg, S.; Nikkanen, J.; Mellin, G.; Lillius, H.: Delta Aminolevulinic Acid Dehydrase as a Measure of Lead Exposure. ARCH. ENVIRON. HEALTH 21:140-145, August 1970.

111. Lin-Fu, J.S.: Screening for Lead Poisoning. PEDIATRICS, 45:720-722, April 1970.

112. Mauzerall, D.; Granick, S.: The Occurrence and Determination of Delta-Aminolevulinic Acid and Porphobilinogen in Urine. J. BIOL. CHEM. 219, 435-446, March 1956.

113. Millar, J.A.; Cumming, R.L.C.; Battistini, V.; Carswell, F.: Lead and Delta Aminolevulinic Acid Dehydratase Levels in Mentally Retarded Children and in Lead-Poisoned Suckling Rats. LANCET 2:695-698, October 3, 1970.

114. Nakao, K.; Wada, O.; Yano, Y.: Delta-Aminolevulinic Acid Dehydratase Activity in Erythrocytes for the Evaluation of Lead Poisoning. CLIN. CHIM. ACTA. 19:319-325, February 1968.

115. Weissberg, J.B.; Lipschutz, F.; Oski, F.A.: ALAD Activity in Circulating Blood Cells - A Sensitive Laboratory Test for the Detection of Childhood Lead Poisoning. N. ENG. J. MED. 284:565-569, March 18, 1971.

116. Williams, M.K.; Few, J.D.: A Simplified Procedure for the Determination of Urinary Delta-Aminolaevulinic Acid. BRIT. J. INDUSTR. MED 24: 294-296, October 1967.

See also 4, 5, **7**, 18, 27, 28, 47, 86, 87, 89, 90, 119, 121, 123, 127, 191, 195, 199, 200.

Coproporphyrin, Porphobilinogen, and Protoporphyrin

117. Aldrich, R.A.; Labbe, R.F.; Talman, E.L.: A Review of Porphyrin Metabolism with Special Reference to Childhood. AM. J. MED. SCIENCE 230: 675, December 1955.

118. Benson, P.F.; Chisolm, J.J.: A Reliable Qualitative Urine Coproporphyrin Test for Lead Intoxication in Young Children. J. PEDIATRICS 56, 759-767, June 1960.

119. Chisolm, J.J.: Disturbances in the Biosynthesis of Heme in Lead Intoxication. J. PEDIATRICS 64:174-187, February 1964.

120. Chisolm, J.J.; Harrison, H.E.: Quantitative Urinary Coproporphyrin Excretion and Its Relation to Edathamil Calcium Disodium Administration in Children With Acute Lead Intoxication. J. CLIN. INVEST. 35:1131-1138, October 1956.

121. Goldberg A.: Lead Poisoning as a Disorder of Heme Synthesis. SEMINARS HEMAT. 5:424-433, October 1968.

122. Hsia, D.Y-Y.; Page, M.: Coproporphyrin Studies in Children: I. Urinary Coproporphyrin Excretion in Normal Children. PROC. SOC. EXPER. BIOL. MED. 85:86-88, January 1954. II. Erythrocyte Coproporphyrin and Protoporphyrin Levels in Normal Infants and Children. PROC. SOC. EXPER. BIOL. MED. 86:89-91, May 1954.

123. Lichtman, H.C.; Feldman, F.: In Vitro Pyrrole and Porphyrin Synthesis in Lead Poisoning and Iron Deficiency. J. CLIN. INVEST. 42:830-839, June 1963.

124. Nelson, J.D.; Dorn, P.; Rogers, L.E.; Sartain, P.: Fluorescence of Erythrocytes in Relation to Erythrocyte Protoporphyrin and to Urinary Lead Excretion. AM. J. CLIN. PATHOL. 50:297-301, Sept.1968.

125. Sano, S.: Studies on the Nature of the Basophilic Stippled Cells in Lead Poisoning. I. Studies on the Cytological Investigation of Basophilic Stippled Cells. ACTA SCHOLAE MEDICINALIS UNIVERSITATIS IN KIOTO 35:149-157, 1958. II. Studies on the Mechanism of Granule Formation of Basophilic Stippled Cells in Lead Poisoning. ACTA etc. 35: 158-163, 1958.

126. Sano, S; Inoue, S.; Tanabe, Y.; Sumiya, C.; Koike, S.: Significance of Mitochondria for Porphyrin & Heme Biosynthesis. SCIENCE 129:275-6, January 23, 1959.

127. Tanabe, Y.: Investigations of the Metabolism of Delta ALA and Porphobilinogen in Lead Poisoning. II. On the Intermediary Metabolism of Porphyrin and Delta ALA Administration. JAP. J. NATION'S HEALTH 28:552, 1959. III. On the Effects of CaEDTA upon the Intermediary Metabolism of Porphyrin. JAP. J. NATION'S HEALTH 28:560, 1959.

128. Watson, R.J.; Decker, E.; Lichtman, H.C.: Hematologic Studies of Children with Lead Poisoning. PEDIATRICS 21:40-46, January 1958.

129. Whitaker, J.A.; Vietta, T.J.: Fluorescence of the Erythrocytes in Lead Poisoning in Children: An Aid to Rapid Diagnosis. PEDIATRICS 24: 734-738, November 1959.

See also 1, 4, 6, 10, 21, 28, 87, 89, 90, 108, 112, 130-134, 191, 199.

METABOLISM

130. Berman, E.: The Biochemistry of Lead: Review of the Body Distribution & Methods of Lead Determination. CLIN. PEDIATRICS 5:287-291, May 1966.

131. Kehoe, R.A.: The Metabolism of Lead in Health and Disease. (The Harben Lectures). J. ROY. INST. PUB. HLTH. HYG. 24:81-97, 101, 129-143, 177-203, April-August 1961.

132. Kehoe, R.A.: Metabolism of Lead Under Abnormal Conditions. ARCH. ENVIRON. HEALTH 8:235-243, February 1964.

133. Kehoe, R.A.: Normal Metabolism of Lead. ARCH. ENVIRON. HEALTH 8:232-235, February 1964.

134. Schroeder, H.A.; Balassa, J.J.: Abnormal Trace Metals in Man: Lead. J. CHRON. DIS. 14:408-425, October 1961.

See also 4-7, 27, 30, 36, 38, 41, 46, 49, 55-57, 59, 60, 79, 83, 86, 109, 110, 113, 115, 191

METABOLIC DISTURBANCES AND TOXICITY

General Information

135. Bells, B.: Influence of Lead on Normal and Abnormal Cell Growth. THE LANCET 1:268-276, February 9, 1924.

136. Hardy, H.L.: Toxicological Appraisal of Lead in Relation to the Considerable Concentration in the Ambient Air. J. AIR POLLUT. CONTR.ASS. 19: 701-703, September 1969.

137. Hardy, H.L.: What is the Status of Knowledge of Toxic Effect of Lead? CLIN. PHARMACOL. & THERAPEUTICS 7:713-722, November-December 1966.

138. Kehoe, R.A.: Toxicological Appraisal of Lead in Relation to the Tolerable Concentration in the Ambient Air. J. AIR POLLUT. CONTR. ASS. 19: 690-700, September 1969.

139. Schroeder, H.A.; Balassa, J.J.; Vinton, W.H.: Chromium, Cadmium, and Lead in Rats: Effects on Life Span, Tumors and Tissue Levels. J. NUTR. 85: 51-66, May 1965.

See also 1-29, 56, 57, 59

Neurological and Psychological Sequelae

140. Byers, R.K.; Lord, E.E.: Late Effects of Lead Poisoning on Mental Development. AM. J. DIS. CHILD. 66:471-494, November 1943.

141. Harrison, H.E.: Lead Poisoning. In DRUGS AND POISONS IN RELATION TO THE DEVELOPING NERVOUS SYSTEM. PHS Pub. 1791. U.S. Dept. HEW, Public Health Service, 1968.

142. Mellins, R.B., Jenkins, C.D.: Epidemiological and Psychological Study of Lead Poisoning in Children. JAMA 158:15-20, May 7, 1955.

143. Pentschew, A.: Morphology and Morphogenesis of Lead Encephalopathy. ACTA NEUROPATHOLOGICA 5:133-160, November 18, 1965.

144. Perlstein, M.A.; Attala, R.: Neurologic Sequelae of Plumbism in Children. CLIN. PEDIATRICS 5:292-298, May 1966.

145. Raimondi, A.J.; Beckman, F.; Evans, J.P.: Fine Structural Changes in Human Lead Encephalopathy. TRANS. AM. NEUROL. ASSN. 91:322-323, 1966.

146. Sauer, R.M.; Zook, B.C.; Garner, F.M.: Demyelinating Encephalomyelopathy Associated with Lead Poisoning in Nonhuman Primates. SCIENCE 169: 1091-1093, September 11, 1970.

147. Smith, H.D.; Bachner, R.L.; Carney, T.; Majors, W.J.: The Sequelae of Pica With and Without Lead Poisoning. AM. J. DIS. CHILD.105:609-616, June 1963.

148. Thurston, D.L.; Middlecamp, J.M.; Mason, E.: The Late Effects of Lead Poisoning. J. PEDIATRICS 47:413-422, October 1955.

149. Weiner, G.: Varying Psychological Sequelae of Lead Ingestion in Children. PUB. HEALTH REPORTS 85:19-24, January 1970.

150. White, H.H.; Fowler, F.D.: Chronic Lead Encephalopathy: A Diagnostic Consideration for Mental Retardation. PEDIATRICS 25:309-315, February 1960.

See also 1-29, 36, 41, 184, 191, 192, 193, 196, 201

Disturbances in Erythrocyte and Heme Synthesis

151. Charache, S; Weatherall, D.J.: Fast Hemoglobin in Lead Poisoning. BLOOD 28:377-386, September 1966.

152. de Kretser, A.J.; Waldron, H.A.: Further Observations on the Mechanical Fragility of the Red Cells in Lead Poisoning. BRIT J. INDUSTR. MED. 22:315-316, October 1965.

153. Hasan, J.; Hernberg, S.; Metsala, P.; Vihko, V.: Enhanced Potassium Loss in Blood Cells from Man Exposed to Lead. ARCH. ENVIRON. HEALTH 14:309-312, February 1967.

154. Moosa, A.; Harris, F.: Erythrocyte Hypoplasia Due to Lead Poisoning. CLIN. PEDIATRICS 8: 400-402, July 1969.

155. Waldron, H.A.: The Anaemia of Lead Poisoning: A Review. BRIT J. INDUSTR. MED. 23:83-100, April 1966.

156. Waldron, H.A.: The Effect of Lead on the Fragility of the Red Cell Incubated in Vitro. J. CLIN. PATH. 17:405-406, July 1964.

See also 30, 86, 101-129, 130-134, 137, 191

Renal Involvement

157. Chisolm, J.J.: Aminoaciduria as a Manifestation of Renal Tubular Injury in Lead Intoxication and a Comparison With Patterns of Aminoaciduria seen in Other Disease. J. PEDIATRICS 60:1, 1-17, January 1962.

158. Emmerson, B.T.: Chronic Lead Nephropathy: The Diagnostic Use of Calcium EDTA & the Association With Gout. AUSTRALIA ANN.MED. 12:310-324, November 1963.

159. Emmerson, B.T.: The Renal Excretion of Urate in Chronic Lead Nephropathy. AUSTRALIA ANN. MED. 14:295-303, November 1965.

160. Goyer, R.A.: The Renal Tubule in Lead Poisoning. I.Mitochondrial Swelling & Aminoaciduria. LAB. INVEST. 19:71-77, July 1968.

161. Goyer, R.A.; Krall, A.: Ultrastructural Transformation in Mitochondria Isolated from Kidneys of Normal and Lead-Intoxicated Rats. CELL BIOL. 41:393-400, May 1969.

162. Goyer, R.A.; Krall, A.; Kimball, J.P.: The Renal Tubule in Lead Poisoning. II. In Vitro Studies of Mitochondrial Structure and Function. LAB. INVEST. 19:78-83, July 1968.

163. Henderson, D.A.: The Aetiology of Chronic Nephritis in Queensland. MED. J. of AUSTRALIA 1:377-386, March 22, 1958.

164. Henderson, D.A.: Chronic Nephritis in Queensland. AUSTRALIA ANN. MED. 4:163-177, August 1955.

165. Henderson, D.A.: A Follow-up of Cases of Plumbism in Children. AUSTRALIA ANN. MED. 3:219-224, August 1954.

166. Henderson, D.A.; Inglis, J.A.: The Lead Content of Bone in Chronic Bright's Disease. AUSTRALIA ANN. MED. 6:145-154, May 1957.

167. Lilis, R.; Gavrilescu, N.; Nestorescu, B.; Dumitriu, C.; Roventa, A.: Nephropathy in Chronic Lead Poisoning. BRIT. J. INDUSTR. MED. 25:196-202, July 1968.

168. Macadam, R.F.: The Early Glomerular Lesions in Human & Rabbit Lead Poisoning. BRIT. J. EXP. PATH. 50:239-240, June 1969.

169. Morgan, J.M.; Hartley, M.W.; Miller, R.E.: Nephropathy in Chronic Lead Poisoning. ARCH. INTERN. MED. 118:17-29, July 1966.

170. Tepper, L.B.: Renal Function Subsequent to Childhood Plumbism. ARCH. ENVIRON. HEALTH 7:82-91, July 1963.

See also 5, 6, 191

Miscellaneous

171. Emmerson, B.T.: The Clinical Differentiation of Lead Gout from Primary Gout. ARTHRITIS & RHEUM. 11:623-634, October 1968.

172. Ferm, V.H.: The Synteratogenic Effect of Lead and Cadmium. EXPERIENTIA 25:56-57, January 15, 1969.

173. Ferm, V.H.; Carpenter, S.J.: Developmental Malformations Resulting From the Administration of Lead Salts. EXPER. & MOLECULAR PATHOL. 7:208-213, October 1967.

174. Freeman, R.: Reversible Myocarditis Due to Chronic Lead Poisoning in Childhood. ARCH. DIS. CHILD. 40:389-393, August 1965.

175. Jovicic, B.: Ulcer & Gastritis in the Professions Exposed to Lead. ARCH. ENVIRON. HEALTH 21:526-528, October 1970.

176. Klinenberg, J.R.: Saturnine Gout - A Moonshine Malady. NEW ENG. J. MED. 280:1238-9, May 29, 1969.

177. Muro, L.A.; Goyer, R.A.: Chromosome Damage in Experimental Lead Poisoning. ARCH. PATH. 87:660-663, June 1969.

178. Sandstead, H.H.; Michelakis, A.M.; Temple, T.E.: Lead Intoxication. Its Effects on the Renin-Aldosterone Response to Sodium Deprivation. ARCH. ENVIRON. HEALTH 20:356-363, March 1970.

179. Sandstead, H.H.; Stant, E.G.; Brill, A.B.; Arias, L.I.; Terry, R.T.: Lead Intoxication & the Thyroid. ARCH. INTERN. MED. 123:632-635, June 1969.

180. Silver, W.; Rodriguez-Torres, R.: Electrocardiographic Studies in Children With Lead Poisoning. PEDIATRICS 41:1124-1127, June 1968.

181. Stern, H.: Lead, Lithium & Manic-Depressive Psychosis. CHICAGO MED. SCH. QUARTERLY 28:87-96, 1969.

182. Urbanowicz, J.; Grabecki, J.; Kozielska, J.: The Urinary Excretion of 5-Hydroxyindoleacetic Acid in Industrial Lead Exposure. MED. LAVORO 60:582-586, October 1969.

PICA

183. Barltrop, P.; The Prevalence of Pica. AM. J. DIS. CHILD. 112:116-123, August 1966.

184. Berg, J.M.; Zappella, M.: Lead Poisoning in Childhood with Particular Reference to Pica and Mental Sequelae. J. MENTAL DEFICIENCY RES. 8:44-53, June 1964.

185. Cohen, G.J.; Lourie, R.S.; Abernethy, W.: Grand Rounds: Pica & Lead Poisoning. CLINICAL PROC., CHILDREN'S HOSP., Washington, D.C., 21:193-204, July-August 1965.

186. Gutelius,M.F.; Millican, F.K.; Layman, E.M.; Cohen, G.; Dublin, C.C.: Nutritional Studies of Children with Pica. I. Controlled Study Evaluating Nutritional Status. II. Treatment of Pica with Iron Given Intramuscularly. PEDIATRICS 29: 1012-1023, June 1962.

187. Lourie, R.S.; Layman, E.M.; Millican, F.K.: Why Children Eat Things That Are Not Food. CHILDREN 10: 143-146, July-August 1963.

188. Millican, F.K.; Layman, E.M.; Lourie, R.S.; Takahashi, L.Y.: The Prevalence of Ingestion and Mouthing of Non-Edible Substances by Children. CLINICAL PROC., CHILDREN'S HOSP., Washington, D.C., 18:207-214, January 1962.

189. Neumann, H.H.: Pica - Symptom or Vestigial Instinct? PEDIATRICS 46:441-444, September 1970.

190. Oliver, B.E.; O'Gorman, P.: Pica & Blood Lead in Psychotic Children. DEVELOP. MED. CHILD. NEUROLOGY 8:704-7, December 1966.

See also 1-35, 142, 147

PREVENTION, TREATMENT, AND MANAGEMENT

191. Chisolm, J.J.: The Use of Chelating Agents in the Treatment of Acute and Chronic Lead Intoxication in Childhood. J. PEDIATRICS 73:1-38, July 1968.

192. Chisolm, J.J.; Harrison, H.E.: The Treatment of Acute Lead Encephalopathy in Children. J. PEDIATRICS 19:2-20, January 1957.

193. Coffin, R.; Phillips, J.L.; Staples, W.I.; Spector, S.: Treatment of Lead Encephalopathy in Children. J. PEDIATRICS 68:198-206, August 1966.

194. Cramer, K.; Selander, S.: Penicillamine and Lead Poisoning. POSTGRADUATE MED. J. Supplement 45-8, October 1968.

195. Goldberg, A.; Smith, J.A.; Lochhead, A.C.: Treatment of Lead Poisoning with Oral Penicillamine. BRIT. MED. J. 1:1270-1275, May 11, 1963.

196. Greengard, J.; Adams, B.; Berman, E.: Acute Lead Encephalopathy in Young Children. Evaluation of Therapy with a Corticosteroid and Moderate Hypothermia. J. PEDIATRICS 66:707-711,April 1965.

197. Sachs, H.K.; Blanksma, L.A.; Murray, E.E.; O'Connell, M.J.: Ambulatory Treatment of Lead Poisoning: Report of 1,155 Cases. PEDIATRICS 46:389-396, September 1970.

198. Schucker, G.W.; Vail, E.H.; Kelley, E.B.; Kaplan, E.: Prevention of Lead Paint Poisoning Among Baltimore Children. PUB. HEALTH REP. 80:969, November 1965.

199. Selander, S.; Cramer, K.; Hallberg, L.: Studies in Lead Poisoning, Oral Therapy with Penicillamine: Relationship Between Lead in Blood and Other Laboratory Tests. BRIT. J. INDUSTR. MED. 23:282-291, October 1966.

200. Selander, S.: Treatment of Lead Poisoning. BRIT. J. INDUSTR. MED. 24:272-282, October 1967.

201. Smith, H.D.; King, L.R.; Margolin, E.G.: Treatment of Lead Encephalopathy. AM. J. DIS. CHILD. 109:322-324, April 1965.

See also 1-29, 33

AUTHOR INDEX

(Numbers refer to items, not pages.)

Abernethy, W., 185
Adams, B., 196
Ahrens, W.E., 8
Aldrich, R.A., 117
American Academy of Pediatrics, 1
Ames, D.C., 61
Andelman, S.L., 10
Angle, C.R., 62
Arias, L.I., 179
Attala, R., 144
Austin, W., 96

Bachner, R.L., 147
Bacon, A.P.C., 63
Balassa, J.J., 134, 139
Bamford, F.N., 73
Barltrop, D., 2, 36, 37, 38, 183
Battistini, V., 113
Beckman, F., 145
Bells, B., 135
Benson, P.F., 118
Berg, J.M., 184
Berman, E., 130, 196
Biehusen, F.C., 64
Bladdedge, P., 75
Blanksma, L.A., 30, 197, 101
Block, J.L., 65
Bonsignore, D., 102
Bowles, J.M., 40
Bradley, J.E., 31
Brattleboro, V.T., 57
Brieger, H., 84
Briley, A.M., 98
Brill, A.B., 179
Buchanan, S., 47
Byers, R.K., 3, 99, 140

California Department of Public Health, 39
Calissano, P., 102
Cannon, H.L., 40
Carbin, R., 68
Carl, J.L., 42
Carney, T., 147
Carpenter, S.J., 173
Carswell, F., 113
Cartasegna, C., 102
Cassady, G., 70
Celewyez, B.S., 10
Charache, S., 151
Chisolm, J.J., 4, 5, 6, 7, 41, 103, 118, 119, 120, 157, 191, 192
Cholak, J., 49
Chow, T.J., 42
Christian, J.R., 9, 10
Clayton, B.E., 21
Coffin, R., 193
Cohen, G.J., 8, 185, 186
Cooke, T.K., 63
Couchman, C.E., 29
Cramer, K., 85, 86, 89, 94, 104, 194, 199
Creason, J.P., 48
Cumming, R.L.C., 113

deBruin, A., 90, 105
Decker, E., 128
de Kretser, A.J., 152
Delves, H.T., 76
Dodge, J.S., 73
Dorn, P., 124
Dublin, C.C., 186
Dumitriu, C., 167

Elsea, W.R., 67
Emmerson, B.T., 43, 158, 159, 171
Ettinger, M.B., 44
Evans, J.P., 145

Faes, M.H., 91
Fairey, F.S., 45
Farrelly, R.O., 77
Feldman, H.T., 11, 106, 123
Ferm, V.H., 172, 173
Few, J.D., 116
Finklea, J.F., 97
Forsby, N., 66
Freeman, R., 12, 32, 174
Fristedt, B., 66
Froome, K., 63

Garner, F.M., 146
Gavrilescu, N., 167
Gent, A.E., 63
Gibson, S.L.M., 78, 107
Goldberg, A., 78, 107, 121, 195
Goldsmith, J.R., 46
Goldwater, L.J., 79
Goyer, R.A., 160, 161, 162, 177
Grabecki, J., 182
Granick, S., 112
Greengard, J., 13, 196
Griggs, R.C., 47
Guinee, V.F., 35
Gutelius, M.F., 186

Haeger-Aronsen, B., 108
Hallberg, L., 199
Hardy, H.L., 136, 137
Hammer, D.I., 97
Harpur, E., 68
Harris, F., 154
Harris, R.W., 67
Harrison, H.E., 41, 120, 141, 192
Hartley, M.W., 169
Harvey, C.C., 72
Hasan, J., 153
Henderson, D.A., 163, 164, 165, 166
Hendricks, R.M., 97
Hernberg, S., 109, 110, 153
Hessel, D.W., 80
Hexter, A.C., 46
Hoolboom, H., 90
Hoover, A.W., 79
Horton, R.J.M., 97
Hunt, W.F., Jr., 48
Hsia, D. Y-Y, 122

Ingalls, T.H., 14
Inglis, J.A., 166
Inoue, S., 126

Jacobziner, H., 33, 34
Jenkins, C.D., 15, 142
Jernigan, W.C.T., 71
Jovicic, B., 175

Kaplan, E., 7, 19, 29, 31, 81, 198
Karpinski, F.E., 84
Kehoe, R.A., 49, 131, 132, 133, 138
Kelley, E.B., 198
Keppler, J.F., 82

King, E., 87
King, L.R., 201
Killala, N.J.P., 37, 38
Kimball, J.P., 162
Kjellman, B., 66
Klein, M., 68
Kleinman, A., 50
Klinenberg, J.R., 176
Knockaert, O.E., 91
Koike, S., 126
Kopito, L., 92, 98, 99
Kopp, J.F., 51
Koumides, O.P., 21
Kozielska, J., 182
Krall, A., 161, 162
Kroner, R.C., 51
Kubota, J., 83

Labbe, R.F., 117
Lagerwerff, J.V., 52
Lam, C.H., 78
Layman, E.M., 186, 187, 188
Lazar, V.A., 83
Lead Industries Association, Inc., 16
Lewis, K., 53
Lichtman, H.C., 106, 123, 128
Linch, A.L., 82
Lin Fu, J.S., 17, 18, 111
Lillius, H., 110
Lilis, R., 167
Lipschutz, F., 115
Lochhead, A.C., 195
Lord, E.E., 140
Losee, F., 83
Lourie, R.S., 185, 187, 188

Macadam, R.F., 168
Madden, J., 24
Maes, G.L., 91
Majors, W.J., 147
Margolin, E.G., 201
Mason, E., 148
Mauzerall, D., 112
Maxfield, M.E., 82
May, J.B., 23
McCrae, W.M., 78
McDonald, J.M., 19, 81
McGrady, J.R., 31
McIntire, M.S., 62
McLaughlin, M.D., 20
McNulty, O., 48
Mellin, G., 110
Mellins, R.B., 15, 142
Metsala, P., 153
Michelakis, A.M., 178
Middlecamp, J.M., 148
Millar, J.A., 113
Miller, R.E., 169
Millican, F.K., 186, 187 188
Moncrieff, A.A., 21
Moore, J.E., 22
Moosa, A., 154
Moss, W.D., 82
Morgan, J.M., 169
Morris, W., 54
Muro, L.A., 177
Murray, E.E., 197
Murray, E.F., 30, 101
Murthy, G.K., 55

Nakao, K., 114
Nelson, J.D., 124
Nestorescu, B., 167
Neumann, H.H., 189
Newill, V.A., 47
Newton, B.W., 47
Niermann, W., 31
Nikkanen, J., 109, 110

O'Connell, M.J., 30, 101, 197
O'Gorman, P., 75, 190
Oliver, B.E., 190
Oransky, S., 106
Orson, J., 23
Oski, F.A., 115

Page, M., 122
Palmisano, P.A., 70
Patrick, A.D., 21
Patterson, C.C., 56
Patterson, M., 71
Peeler, J.T., 55
Pentschew, A., 143
Perlstein, M.A., 144
Phillips, J.L., 193
Pinkerton, C., 48
Powell, A.E., 31
Pueschell, S.M., 100
Pulaski, E.J., 64
Pybus, J., 77

Raimondi, A.J., 145
Rasch, C.A., 47
Raybin, H.W., 34
Reiser, L., 106
Rendel-Short, J., 72
Rennert, O.M., 24
Renwick, A.G.C., 21
Rhea, U., 55
Roberts, G.E., 21
Robinson, M.J., 84
Rodriquez-Torres, R., 180
Rogers, L.E., 124
Rothschild, E.O., 25
Roventa, A., 167

Sachs, H.K., 30, 101, 197
Sandstead, H.H., 178, 179
Sano, S., 125, 126
Sartain, P., 124
Sauer, R.M., 146
Sayers, R.R., 29
Schroeder, H.A., 57, 134, 139
Schucker, G.W., 198
Segal, R.J., 93
Selander, S., 85, 86, 89, 94, 104, 194, 199, 200
Sharifi, M., 13
Shwachman, H., 92, 98, 99
Shy, C.M., 97
Silver, W., 180
Smith, J.A., 195
Smith, H.D., 26, 147, 201
Sneed, R.C., 70
Sowerby, P., 63
Specht, A.W., 52
Spector, M.J., 35
Spector, S., 193
Sta Ana, E., 106
Stant, E.G., 179
Staples, W.I., 193
Stern, H., 181
Sumiya, C., 126
Sunshine, I., 47
Swift, P.N., 61

Takahashi, L.Y., 188
Talman, E.L., 117
Tanabe, Y., 126, 127
Temple, T.E., 178
Terry, R.T., 179
Thamann, F., 49
Thomas, H.V., 58
Thurston, D.L., 148
Tiboni, E.M., 14
Tietjen, G., 82
Tipton, L.H., 57
Topper, L.B., 170
Torres, F., 95
Travers, E., 72
Turner, W., 73

Urbanowicz, J., 182
U.S. Dept. Health, Education, & Welfare, 27, 28, 59, 60

Vail, E.H., 198
Vietta, T.J., 129
Vihko, V., 153
Vinton, W.H., 139

Wada, O., 114
Waldron, H.A., 152, 155, 156
Walford, J., 87
Walls, A.D., 74
Walters, R.M., 88
Warley, M.A., 75
Watson, R.J., 128
Weatherall, D.J., 151
Weiner, G., 149
Weiner, P., 24
Weissberg, J.B., 115
Werrin, M., 14
Whitaker, J.A., 96, 129
White, H.H., 150
Williams, H., 29
Williams, M.K., 87, 116
Woods, G.E., 88

Yano, Y., 114

Zappella, M., 184
Zollar, L., 13
Zook, B.C., 146

U.S. GOVERNMENT PRINTING OFFICE : 1972 O - 464-311

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service
Health Services and Mental Health Administration
Maternal and Child Health Service
Rockville, Maryland 20852

OFFICIAL BUSINESS
Penalty for Private Use $300

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF H.E.W.

DHEW Publication No. (HSM) 72-5105